

REMARKS

In view of the above amendments and following remarks, reconsideration and further examination are requested.

Initially, a replacement formal drawing has been provided for Fig. 10 so as to designate this figure as --Prior Art--.

The specification and abstract have been reviewed and revised to make editorial changes thereto and generally improve the form thereof, and a substitute specification and abstract are provided. No new matter has been added by the substitute specification and abstract.

Claims 21-36 have been canceled and claims 37-56 have been added. New claims 37-56 have been drafted taking into account the 35 U.S.C. § 112, second paragraph, issues raised by the Examiner, are believed to be free of these issues, and are otherwise believed to be in compliance with 35 U.S.C. § 112, second paragraph.

The instant invention pertains to a component mounting apparatus and component mounting method for mounting a component onto a circuit-formed member. Before mounting the component onto the circuit-formed member, a component that is held by a nozzle is recognized so as to determine a correction quantity with respect to a placement position of the component onto the circuit-formed member. A correctional operation is performed (such as rotation of the nozzle) based on this correction quantity, and then the component is mounted onto the circuit-formed member.

Such a component mounting apparatus and component mounting method are generally known in the art, but suffer from a drawback in that when the component is held by the nozzle in a deviated position, for example when the center of gravity of the component is not aligned with a central axis of the nozzle, during conveyance of the nozzle and the component to a location at which the component is to be mounted onto the circuit-formed member, a force acting on the component may cause the component to deviate further from the state in which it was recognized, whereby placement of the component onto the circuit-formed member may be inaccurate even after a correctional operation is performed. Applicants have addressed and

resolved this drawback by providing a unique component mounting apparatus and component mounting method.

Specifically, after recognizing the component, and prior to mounting the component onto the circuit-formed member, the amount that the component deviates from a normal position on the nozzle is determined, and based on this deviation, the speed at which the nozzle and the component are conveyed is controlled such that no additional deviation results from conveyance of the nozzle and component. New claim 37 is believed to be representative of Applicants' inventive apparatus, and new claim 47 is believed to be representative of Applicants' inventive method.

Claims 21-36 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Okumura et al. This rejection is respectfully traversed, and Okumura et al. is not applicable with regard to the newly added claims for the following reasons.

Okumura et al. discloses that when a plurality of types of parts having different shapes and sizes are mounted onto a board together, a group of parts which are less subject to a positional error, due to a **movement speed of an X-Y table** on which the board is placed, are repeatedly mounted first on the board at a high movement speed, and a group of parts which are more subject to a positional error are repeatedly mounted in the same manner at a low movement speed. Accordingly, prevented is a positional error due to an inertial force upon high-speed **movement of the X-Y table**. Thus, contrary to the instant invention, Okumura et al. fails to teach or suggest that a velocity of conveyance of a suction nozzle holding a component is controlled on the basis of a magnitude of a deviation of this held component from a normal suction status of the component.

In its broadest sense, Okumura et al. can possibly be said to teach the concept of controlling the relative speed between a component and a member onto which the component is to be mounted; however, independent claims 37 and 47 require more than this. Specifically, these claims require that velocity is controlled in response to a **deviation of a suction position of the component from a normal suction status of the component on the basis of a recognized posture of the component**. Thus, each individual component to be mounted is

recognized so as to determine a deviation of this component, as held by the nozzle, from a reference holding position of the component on the nozzle, and then this deviation is used to control the speed at which the component is conveyed to a component mounting placement position.

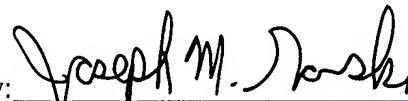
Okumura et al. is silent as to determining any deviation of a held component from a reference holding position, and thus does disclose or suggest controlling the speed at which a component is conveyed based on this deviation. Indeed, Okumura et al. does not adjust a mounting procedure based on any recognized position of a component, but rather adjusts a mounting procedure based on a “type” of component to be mounted. Specifically, the speed at which X-Y table 10 is moved is controlled based upon the type of component to be mounted. That is, a group of parts which are less subject to a positional error due to the movement speed of the X-Y table are mounted at a high movement speed of the X-Y table, and a group of components which are subject to a greater positional error due to movement of the X-Y table are mounted at a lower movement speed of the X-Y table. Please see column 6, line 43 through column 7, line 20 of Okumura et al.

Thus, Okumura et al. does not teach or suggest the invention as recited in either of claims 37 and 47, whereby claims 37-57 are allowable, and an early Notice of Allowance is earnestly solicited.

If after reviewing this Amendment, the Examiner believes that any issues remain which must be resolved before the application can be passed to issue, the Examiner is invited to contact the Applicants' undersigned representative by telephone to resolve such issues.

Respectfully submitted,

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AMENDMENTS TO THE DRAWINGS

A replacement formal drawing for Fig. 10 has been filed concurrently.